

# AUSTRALIANS THE ANTARCTIC

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# ANTARCTICA

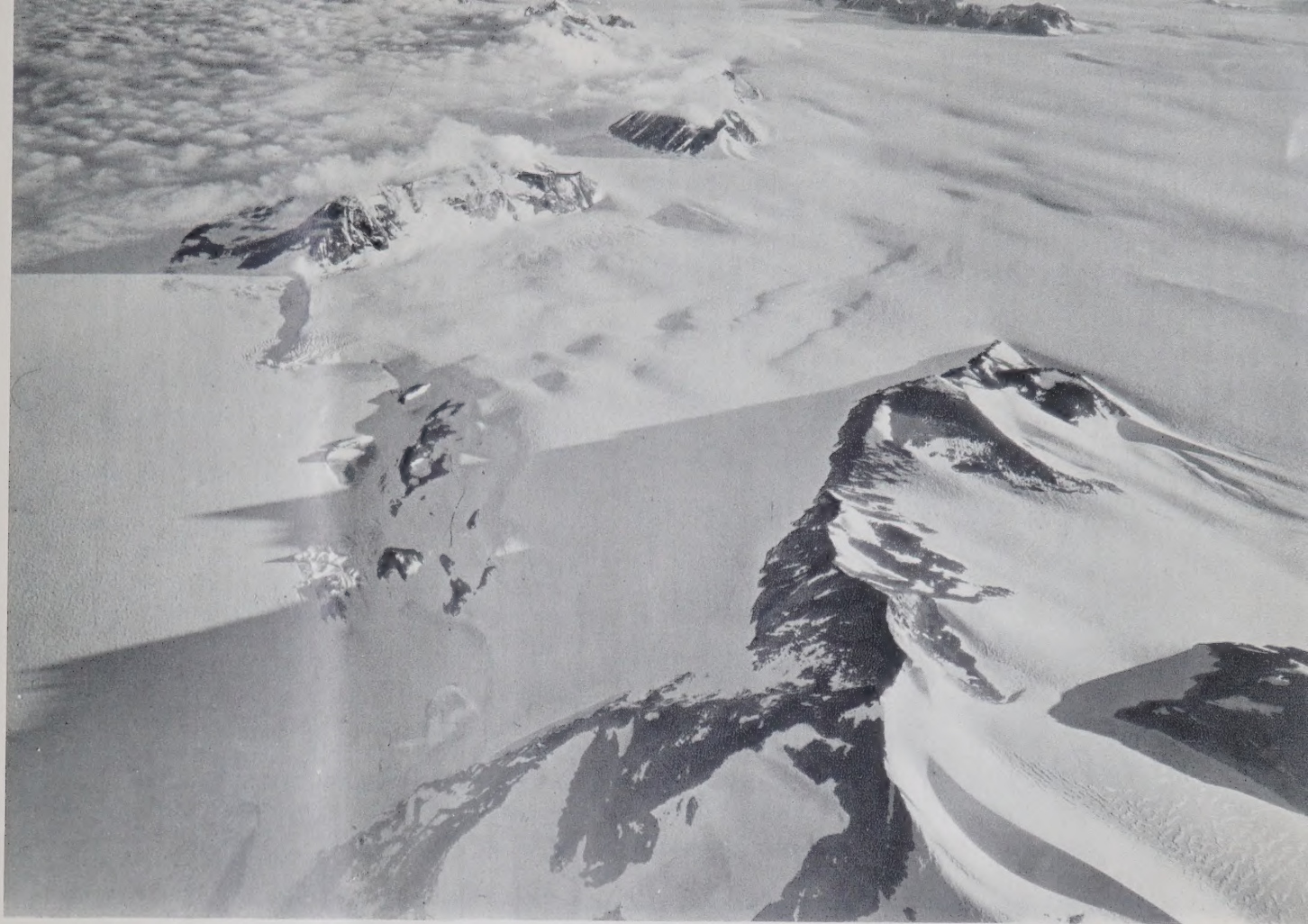
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Front cover photograph by J. BÉCHERVAISE; back cover photographs by A. CAMPBELL-DRURY

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A.N.A.R.E. Photo

*Aerial view of the Scott Mountains in Enderby Land. This area of the Antarctic was first sighted and named by a whaling captain in 1831.*

## THE LAND

Antarctica, with an area of 5,402,000 square miles, is about equal to the combined areas of Australia and U.S.A. This great elevated continent is for the most part covered by an ice sheet which is believed to average more than 6,000 feet in thickness.

Its climate is the coldest and harshest in the world. At the coast the mean annual temperature is 0° Fahrenheit; 400 miles inland it is -30° F.; and 900 miles inland it is -60° F. The lowest recorded temperature for Antarctica is -126.9° F. The cold is aggravated by constant strong winds which, in many coastal areas, blow with unbelievable violence.

The seas surrounding the Antarctic continent freeze during the winter months for hundreds of miles off-shore. In summer this ice breaks up to form pack ice which, under the action of prevailing winds and tides, is constantly changing in form and distribution. It constitutes a hazard to shipping

and a barrier which makes access to the coast extremely difficult.

Vegetable life on the continent is confined to the most primitive types of mosses, lichens and algae. Land animals, with the exception of a few mites and insects, are absent. Around the coast, however, marine animals and birds, such as seals, penguins, and petrels, come ashore in large numbers to breed.

Australia's immediate interests lie in Australian Antarctic Territory which comprises all the islands and territories, other than Terre Adélie, situated south of the 60th degree of south latitude and lying between the 45th and 160th degrees of east longitude. These interests extend to her sub-Antarctic possessions — Heard Island (and the associated small McDonald Islands) and Macquarie Island.

With an area of 2,360,000 square miles, Australian Antarctic Territory comprises three-sevenths of the area of Antarctica. Its coastline of 4,700 miles is about one quarter of that of the whole of Antarctica.

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## ITS HISTORY

The history of Antarctic exploration, like the history of Australia, begins with the voyages of Captain Cook in the 1770's. Captain Cook did not discover the Antarctic but, by sailing right around it and probing with his ships as far south as he could, he showed that if an Antarctic land mass existed, most of it lay within the Antarctic Circle and was a barren waste of ice and snow.

Since then, particularly after the first decade of the 19th century, journeys to the Antarctic, under various national flags, have been undertaken by governments, commercial enterprises and private individuals. Some were inspired by Cook's description of the teeming seal colonies of what is now called South Georgia and the prospect of riches from fur and blubber-oil; others were prompted by the love of pure science or the urge to explore. But, whatever the motives for their journeys, valuable discoveries often resulted.

The first sightings of those coasts now included in Australian Antarctic Territory were made by a number of early 19th century sealing and whaling captains in the second and third decades of the century. After the discovery of Macquarie Island

by Captain F. Hasselburgh in 1810, Captain J. Biscoe sighted and named Enderby Land in 1831. Then in 1833 Captain P. Kemp sighted Heard Island, and later made a landfall on the Antarctic coast which he named Kemp Land. The next sightings were made in 1839 by Captain J. Balleny when he sighted the Balleny Islands, and later made a landfall on the continental mainland, naming it Sabrina Coast.

These discoveries stirred the interest of European scientists and geographical societies. As a result, several government-sponsored expeditions were organised and operated in Antarctic waters in 1840 and 1841. A French expedition led by Dumont d'Urville discovered Adélie Land; an American expedition led by Lieutenant C. Wilkes made sightings along what has since been called Wilkes Land; and a British expedition, led by Captain J. C. Ross, discovered the Ross Sea, the Ross Ice-Shelf and South Victoria Land.

These expeditions all visited Australian ports, and their discoveries established a tradition of Antarctic interest in Australian scientific circles. This interest did not bear fruit, however, until 1886 when the Royal Society of Victoria and the Victorian Branch of the Royal Geographical Society of Australasia jointly set up the first Australian

*M. V. Magga Dan beset in pack ice under pressure off the Dalton Iceberg Tongue, while returning from Chick Island in February, 1961.*

Photo: P. G. LAW





Antarctic Exploration Committee to work with a similar body in England to bring about a renewal of Antarctic exploration. The Australian body, which included eminent scientists like the botanist Baron F. von Mueller as members, worked strenuously, though unsuccessfully, over the next ten years to sponsor expeditions for both scientific and commercial purposes. Its work did, however, stimulate overseas commercial and scientific interest in the Antarctic.

As a result, a Norwegian resident in Melbourne, H. J. Bull, organised a small Norwegian whaling expedition in the ship *Antarctic* to investigate southern whaling prospects, and in January, 1859, effected the first landing ever to be made on the Antarctic mainland, at Cape Adare. One of the crew, a Norwegian named C. E. Borchgrevink, who had come to Australia in 1888, later succeeded in raising sufficient funds in the United Kingdom to organise and lead the British Antarctic Expedition of 1898-1900. This expedition landed a party at Cape Adare which was the first to spend a winter on the Antarctic continent.

A young Tasmanian physicist, Louis Charles Bernacchi, who had come to Australia in 1884 as a child, was a member of this party, and so became the first Australian to visit and winter on the Antarctic mainland.

Early in the twentieth century a number of Australians joined in Antarctic work with British expeditions. Bernacchi accompanied Scott's 1901-03 expedition as physicist, Mawson and Edgeworth David joined Shackleton's 1906-7 expedition, while Taylor and Debenham accompanied the ill-fated Scott expedition of 1910-13.

Mawson then organised and led the Australasian Antarctic Expedition of 1911-14 which established bases in King George V Land and Queen Mary Land and also on Macquarie Island. By sledge journey and ship the expedition charted over 700 miles of new coastline for the first time and Mawson penetrated 250 miles inland, the first excursion into the interior of Australian territory. The expedition was splendidly staffed and equipped, carried out extensive scientific observations and proved an outstanding success.

Fifteen years later, in 1929-31, Sir Douglas Mawson led the British, Australian and New Zealand Antarctic Research Expedition (BANZARE), discovering Mac.Robertson Land and Princess Elizabeth Land and recharting the coastline of Wilkes Land. British sovereignty was proclaimed at seven localities and, two years after the expedition had returned, the Australian Antarctic Territory was established by an Order in Council.



Photo: G. LOWE

Top: Phillip Law, Australian Antarctic expedition leader since 1949.

Bottom: Gentoo penguins exchange greetings at nest on Heard Island.

Photo: A. CAMPBELL-DRURY







Photo: G. BUDD

*Bottom: Emperor penguin entering "pop-hole" to fish beneath the ice.*



Photo: G. NEWTON

*Top: ANARE aircraft being landed from a rubber raft at Mawson.*

The Order was officially gazetted on March 16, 1933, and after the passage of the Australian Antarctic Territory Acceptance Act on June 13, came into force with the Proclamation of August 24, 1936. By the provisions of the Act, the Australian Government became responsible for the area now known as Australian Antarctic Territory.

During the same period two other Australians—Hubert Wilkins and John Rymill—carried out valuable work in Graham Land. In November, 1928, Wilkins, leading a private expedition, made the first aeroplane flight in the Antarctic. Important geographical observations were made, and the value of the aeroplane for survey and reconnaissance work in Antarctica was clearly demonstrated.

John Rymill led the British Graham Land Expedition which spent the years from 1935 to 1937 in Graham Land, carrying out a most valuable programme of land and sea exploration, surveying and mapping, and biological studies.

Preliminary moves led by Sir Douglas Mawson to mount a new Australian Antarctic expedition





Photo: P. G. LAW

*The landing of stores by rubber raft on the shingle beach at Macquarie Island can be quite a hazardous operation when the surf is very heavy.*

were interrupted by war in 1939, but in 1947 the Australian Government formed the Australian National Antarctic Research Expeditions (ANARE). Group Captain Stuart Campbell was appointed leader, and guided the infant organisation through its first two years of operation.

Stations were established at Heard Island and Macquarie Island in the summer of 1947-48, but an Antarctic reconnaissance voyage failed when the expedition ship *Wyatt Earp* could not penetrate thick pack-ice off the coast of King George V Land.

In January, 1949, Phillip Law succeeded Stuart Campbell as leader of the ANARE, and was appointed Director of a newly created permanent organisation — the Antarctic Division of the Department of External Affairs. Between 1949 and 1953 the Antarctic Division extended and developed its scientific work at the two island stations, while examining the possibilities of establishing a third station on the Antarctic continent.

The chief difficulty was the lack of a ship capable of penetrating the pack-ice, but in 1953

a suitable ship was found. This was the *Kista Dan*, built in Denmark in 1952 for the J. Lauritzen Line, which had operated for many years in Greenland waters and knew the requirements for ice navigation. She was especially suited to ANARE's purpose, and her owners agreed to charter her to the Australian Government. Approval was given to the Antarctic Division to organise an expedition to set up a permanent station in Australian Antarctic Territory. The expedition, led by Phillip Law, succeeded in establishing a station in MacRobertson Land, which was named Mawson on February 13, 1954, in honour of Australia's premier Antarctic explorer.

The following year the Heard Island station was closed down, but in the summer of 1956-57 a second mainland station named Davis was established by Law and his men in Princess Elizabeth Land. Early in 1959 the ANARE took over administrative control of Wilkes Station, which had been set up by a United States expedition in 1957 for the International Geophysical Year.

Australia is now maintaining four stations — Macquarie Island, Mawson, Davis and Wilkes.





Photo: P. G. LAW

*Automatic weather station on Chick Island, on the fringe of the Antarctic mainland, is powered by a wind-driven generator.*

## THE ANARE STATIONS

MAWSON lies on the desolate coastline of Mac-Robertson Land. The station is built on a bare horseshoe of dark brown rock jutting from the edge of the continental ice. The two arms of the horseshoe enclose a small, deep-water harbour which is further protected by a scattering of islands close off-shore. As far as the eye can see on either side of Mawson the polar ice cap meets the sea in jagged blue-green cliffs, and numerous icebergs lie grounded along the coast. To the south rises the vast Antarctic Plateau, broken only by Mount Henderson and the peaks of the Casey, David and Masson ranges.

DAVIS lies 400 miles east of Mawson, on the coast of the Vestfold Hills in Princess Elizabeth Land. The Vestfold Hills constitute an unusual 300-square-mile oasis of ice-free rock, studded with lakes and dissected by fjords, which face westwards on to Prydz Bay. To the east is the featureless Antarctic Plateau.

WILKES, about 1,250 miles east of Mawson, is the ANARE station nearest to Australia. It is built on a rocky peninsula on the eastern side of Vincennes Bay, Wilkes Land. Other rock peninsulas and numerous islands extend southwards along this side of the Bay.

MACQUARIE ISLAND is a long, narrow ledge of land, 21 miles long and three miles wide. Most of it is a plateau 1,000 feet high, which descends abruptly to narrow shingle beaches. There are no trees on the island, but the vegetation is luxuriant, with flowering grasses and various broad-leaved succulents. It is inhabited by penguins—on its most southerly point, it boasts the biggest rookery in the world—and by elephant seals and many varieties of sea-birds. At the extreme northern end a narrow

isthmus leads to a bold headland on which Douglas Mawson established his expedition's radio station in 1911. The Macquarie Island Station is built on the isthmus in the shelter of the headland and on the site of Mawson's old camp.

During 1961 the stations at Mawson, Davis, and Wilkes and Macquarie Island are being manned by 25, 9, 24, and 13 men respectively. At each station the maintenance staff consists of an officer-in-charge, a medical officer, radio operators, mechanics, a cook and sometimes a carpenter or a plumber. The scientific staff includes meteorologists, physicists, geologists, surveyors, glaciologists and biologists, the team varying from year to year according to the research programme.

The Mawson, Wilkes and Macquarie Island stations each contain more than 30 buildings. Each has a central core of quarters surrounded by scientific laboratories, power house, radio station, store huts and other facilities. Electricity is generated by diesel-driven alternators and distributed throughout the stations. The insulated huts are heated by oil, coke or briquette stoves, and kitchens are provided with large slow-combustion coke stoves and electric ovens.

The victualling of the stations has been carefully planned. Quantities of deep-frozen meats and vegetables are backed up by fresh eggs and fruit and tinned and dehydrated foods. At Macquarie Island, domestic animals have been introduced to augment the station's supplies of fresh meat. Cows, sheep, pigs, ducks and fowls have all provided welcome additions to the menu.

Everything possible is done to ensure the comfort and well-being of ANARE men. There are good libraries, gramophone records, cine projectors with film programmes, and a reasonable issue of beer, wines, tobacco and cigarettes.



# ANARE EXPLORATION

Since the establishment of Mawson in 1954, ANARE men have carried out extensive explorations of Australian Antarctic Territory. Wintering parties at Mawson and Davis, using aircraft, snow vehicles and dog sledges, have mapped an area of 250,000 square miles in a semi-circle with Mawson as its centre. This has proved to be the most interesting area in the A.A.T. because of the numerous mountain ranges and the great areas of exposed rock.

South of Mawson lie, first, the coastal ranges of the Framnes Mountains, while further inland are the extensive Prince Charles Mountains. To the west are the mountainous areas of Enderby Land and the interesting inlets of Edward VIII Gulf, Amundsen Bay and Casey Bay.

From Davis, the "oasis" areas of the Vestfold Hills and the Larsemann Hills have been explored. Nearby the Amery Ice Shelf, in Prydz Bay, forms the terminal of the huge Lambert Glacier which extends inland for several hundreds of miles.

During the I.G.Y., tractor trains from Mawson carried men 400 miles inland over the Antarctic Plateau to measure thicknesses of the ice cap, using seismic methods. Similar work is now being carried out from Wilkes.

Aircraft operating from Mawson and flown by R.A.A.F. members of the expeditions have flown 10,000 miles on photographic flights, taken more than 26,000 aerial photographs. Numerous other flights have been made in support of field parties engaged in geological and survey work.

During relief voyages the ANARE ships *Kista Dan*, *Thala Dan* and *Magga Dan* have explored more than 4,000 miles of coastline extending from Enderby Land in the west to Oates Land in the east. Float planes have carried out aerial photography, and landings have been made by motorboat and helicopter to obtain astrofixes, to examine the geology along rocky sections of unknown coast and to make gravity and magnetic measurements. Extensive depth soundings in previously uncharted waters have been obtained.

From all this work accurate maps of the Australian Antarctic Territory have been compiled and work is proceeding to fill in the detail in the areas where rock outcrops make further work worthwhile.

Two automatic weather stations have been set up at isolated points 370 miles apart on the coast of Wilkes Land. That at Lewis Island was built in January, 1958, and that at Chick Island in February, 1961.



Photo: G. JOHANSEN

*Top: Refuelling a Beaver aircraft on the frozen harbour at Mawson.*

*Bottom: Making an astrofix at Aviation Islands, off Oates Land.*

Photo: P. G. LAW

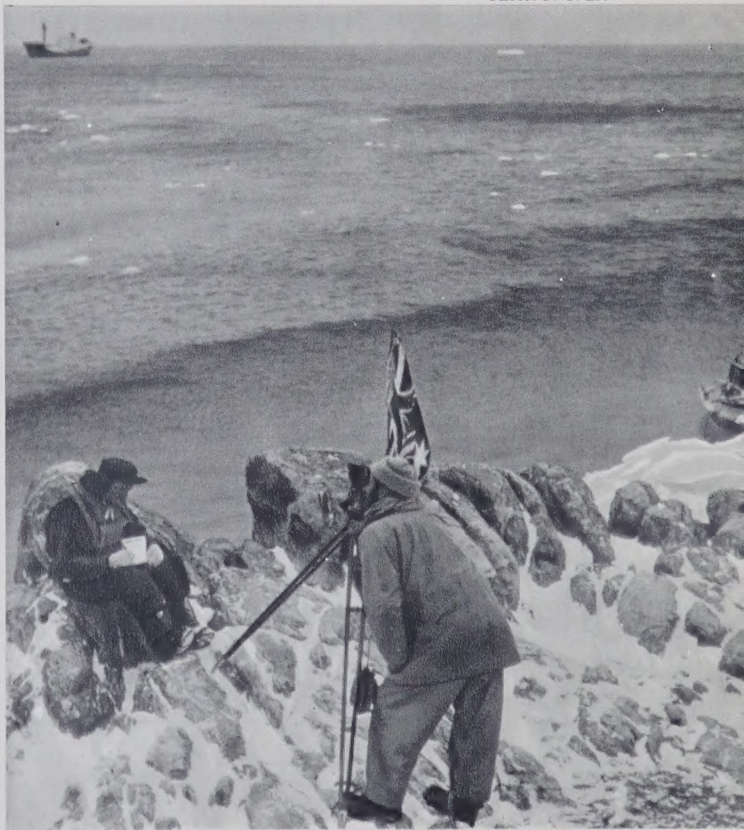






Photo: P. G. LAW

*Top left: Lewis Island automatic weather station broadcasts data every six hours.*

*Bottom left: Mawson lies on bare rock at edge of plateau, with David Range to south.*

Photo: P. G. LAW



*Top centre: Living quarters at Mawson in 1960, showing the kitchen.*

*Bottom centre: Wilkes station is buried to the roof-tops in winter snow.*







Photo: H. J. EVANS

recreation room, sleeping quarters, surgery and the store huts.

ed auroral observatory rises high above the other buildings

Photo: W. R. J. DINGLE



Photo: P. G. LAW

Top right: Macquarie Island station lies on a narrow isthmus at the northern end.

Bottom right: Davis in the Spring. Snow and ice melt away during the short summers.

Photo: W. R. J. DINGLE





## SCIENTIFIC PROGRAMMES

The geophysical work of the ANARE began in 1948 when studies in meteorology, cosmic rays and aurora began at Heard Island and Macquarie Island. In the years that followed, other programmes were added (geomagnetism, seismology, radio physics) until, by 1956, Macquarie Island and Mawson were elaborately equipped geophysical observatories.

Australia was therefore in a good position to co-operate with other nations during the International Geophysical Year of 1957-58. This period of world-wide observations proved so scientifically fruitful that scientists were eager to see the Antarctic geophysical programmes and the international co-operation in Antarctic research continued at the highest possible level for a number of years. Australians at present are therefore pushing on with their scientific studies in a wide variety of subjects at Mawson, Davis, Wilkes and Macquarie Island in accordance with the recommendations of the Special Committee on Antarctic Research (SCAR), an international body formed to co-ordinate the post-I.G.Y. work.

Meteorology remains one of the most important and fruitful of these studies. Normal weather observations using instruments at the Earth's surface are augmented by upper air observations made from balloons which rise to between 60,000 and 100,000 feet above sea level. The work at the ANARE station is supplemented by records from the automatic unmanned stations at Lewis Island and Chick Island and from semi-automatic posts set up inland from Mawson and Wilkes stations. Our general knowledge of the circulation of the atmosphere in the temperate and frigid zones of the Southern Hemisphere is expanding rapidly, while the impact of this knowledge upon the efficiency of weather forecasting in Australia and other southern continents is gradually being felt. Recently an International Antarctic Analysis Centre was established in Melbourne for the analysis of meteorological data which is gathered from every station at present operating in Antarctica.

ANARE glaciologists are investigating the "balance sheet" of the accumulation of snow on the continent against the wastage due to the evaporation, melting and blowing away of snow and the "calving" of icebergs at the coast. At present it is not clear whether the great bulk of the continental ice sheet is diminishing or increasing. Measurements of its thickness by seismic



Photo: J. BÉCHERVAISE

*Top: Measuring radiation from sun and ice reflection at Mawson.*

*Bottom: Balloons are used to record upper wind direction and speed.*

Photo: G. NEWTON





sounding show that there are roughly five million cubic miles of ice in Antarctica, so even small changes in its thickness will have marked effects on the weather and the oceans.

Geological work aims at developing our knowledge of the geological structure of the Antarctic Continent and the history of its formation. At the same time mineral investigations may lead to the discovery of ore deposits.

ANARE geophysicists are contributing towards the mapping of the sub-glacial rock surface of Antarctica. Although this has the general form of a continent, much of the rock is now known to be below sea level and vast areas probably take the form of islands supporting huge thicknesses of superimposed ice.

Seismographs at the ANARE stations provide records of both local and distant earthquakes. Travel times of the several phases of the disturbances are directly related to the structure and physical state of the interior of the Earth. These records are contributing towards a better understanding of the large scale geological features of Antarctica and are adding to the store of data available for testing new ideas concerning the Earth's interior.

*T.N.T. is exploded in a 100ft. drill hole during seismic tests of ice thickness on the Antarctic Plateau. Calculations are then made, based on the time the sound takes to travel to the rock bottom and back.*

Photo: K. MATHER



Photo: M. MELLOR

*Top: Snow drift gauges measure amount of snow blown away seaward.*

*Bottom: A geophysicist and mechanic drill a seismic test hole in ice.*

Photo: N. COLLINS





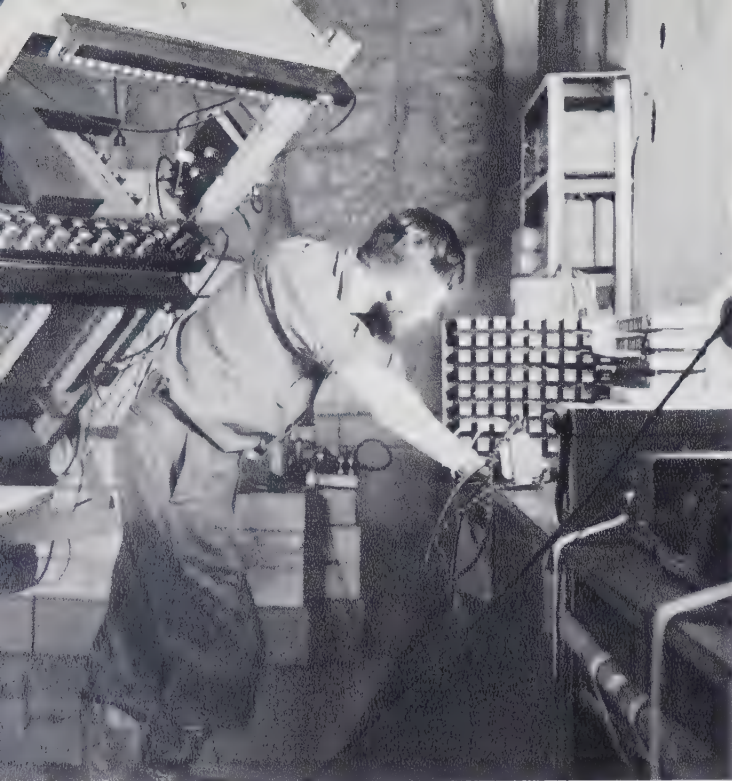


Photo: G. NEWTON

*A geiger counter telescope records cosmic rays at Mawson station.*



Photo: I. FOX

*Geophysicist at Macquarie Island measures Earth's magnetic field.*

The biological work of ANARE is concerned largely with the ecology of seals and penguins which populate the Antarctic coastlines. Knowledge of the feeding, mating and breeding habits of these animals and their dependence on the environment is being obtained. Other work is concerned with the physiology of the animals and also of man when he lives in this frigid environment. However, much remains to be done, especially in the study of the teeming plankton and fish life of the southern seas which supports these larger species.

Measurements of the Earth's magnetic field over long periods at ANARE stations and at many points visited around the coast are contributing towards a better understanding of the changes taking place in the structure of the fluid interior of the Earth. Gravity measurements at many points along the coast provide further information on the shape and internal structure of the Earth.

However, studies of the Earth's magnetism have much wider significance. The upper reaches of the Earth's atmosphere provide one of the most spectacular and beautiful effects — the polar aurora. The aurora australis is seen on most nights over each of our Antarctic stations. The Earth's magnetic field lines from polar regions reach far

out into space, where they trap and hold electrically charged ions and electrons (the so-called "Van Allen radiation" recently discovered with the aid of satellites and rockets). The geomagnetic field forms a huge "magnetic bottle." Leakage of charged particles from the "bottle," which are associated with disturbances on the sun, produce the aurora. Associated electric currents, perhaps produced by the action of wind on the auroral ionisation, cause complex changes in the structure of the ionosphere and fluctuations in the magnetic field recorded at the ground.

ANARE physicists photograph the distribution of auroras over the sky and measure their intensity and spectral characteristics while recording the changing distribution of electron density in the upper atmosphere. These latter measurements have an immediate use for determining appropriate wavelengths and times for world-wide radio communications which involve reflection of the radio waves from the under-side of the ionosphere. Future communications via satellites will only be possible if we have a much better understanding of higher regions of the upper atmosphere. The aurora, occurring between 50 and 500 miles above the Earth, facilitates the study of these regions.

Studies of these phenomena may also throw



some light on the problems of harnessing controlled nuclear fusion to produce useful energy. Present efforts to contain fusion reactions depend on "magnetic bottles." New ideas on the causes of leaks in these "bottles," gained from geophysical studies, may help to overcome the major difficulties.

Measurements of the variations of intensity of the cosmic radiation at ANARE stations are providing further information about interplanetary space and the complex processes by which disturbances are propagated from the sun to the Earth's upper atmosphere. The Antarctic observations are especially valuable because they indicate the variations in the low energy particles which are prevented from reaching low latitudes by the Earth's magnetic field.

There is no doubt that the enthusiasm of the scientist stems from his opportunity for understanding things, for formulating new concepts and creating new theories. In Antarctica there is wide scope for this in many branches of science. The technological progress upon which man's future will be based depends upon a better understanding of the fundamental problems with which Antarctic scientists are wrestling.

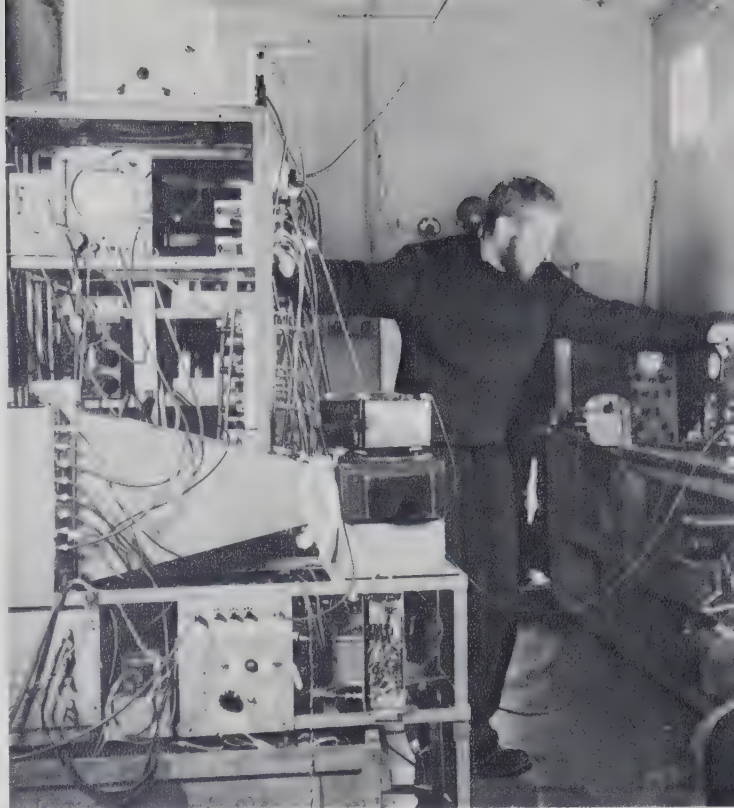


Photo: G. NEWTON

*Top: Radar equipment at Mawson measures the velocity of winds 60 miles above the Earth by tracking trails of ionized gas left by meteors which penetrate the upper layers of the atmosphere.*

*An "all-sky" camera automatically records the aurora australis. On the right a series of its special photographs shows typical aurora movements.*

Photo: A. CAMPBELL-DRURY

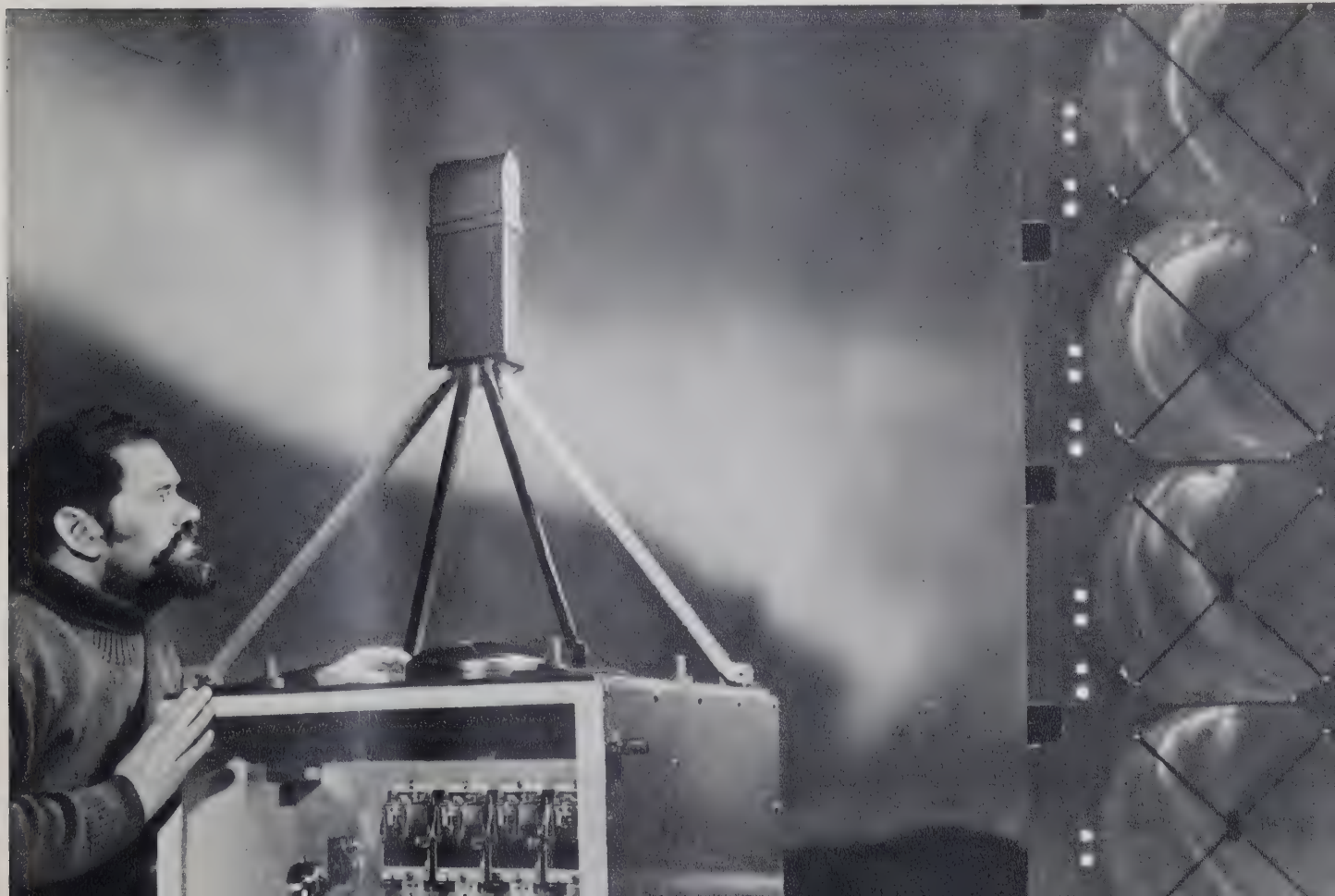






Photo: J. BÉCHERVAISE

*Physiological tests determine man's adaptability to extreme climate.*



Photo: I. FOX

*Collecting some lichen samples from the rocks at Macquarie Island.*



## ANARE ORGANISATION

Since 1949 the planning and management of the Australian National Antarctic Research Expeditions have been the responsibility of the Antarctic Division of the Department of External Affairs. The Division is located in Melbourne. The scientific work of the ANARE is shared by a number of government organisations and universities and the whole is financed by the Australian Government.

The Commonwealth Bureau of Meteorology plans and directs the meteorological programme and provides personnel for this work. The Bureau of Mineral Resources, Geology and Geophysics does the same in regard to geology, geomagnetism, gravity and seismology. The National Mapping Division of the Department of National Development supervises the mapping programme; the Army provides Dukws and personnel to man them; the R.A.A.F. supports the aviation programme with airmen and technical help; and the R.A.N.

*Left: A geologist examining rocks in the Mawson area.*

Photo: G. LOWE



assists with hydrographic work and victualling. The Ionospheric Prediction Service of the Department of the Interior carries out ionospheric studies, and the C.S.I.R.O. advises on the biological programme. Many other government departments or agencies assist the ANARE in such matters as transport, communications, buildings, stores, health, library and information facilities, and public relations.

The Antarctic Division itself carries out scientific research on those problems which are unique to the Antarctic in the fields of glaciology, upper atmosphere physics, physiology and biology. The universities of Sydney, Adelaide and Tasmania give important assistance with cosmic ray studies, ionospheric investigations and biology, while the Australian Academy of Science maintains a close interest in the whole research programme.

The logistic support of the expeditions is provided by the Antarctic Division, which is directly responsible for the provision of transport, buildings, radio communications, food and clothing, power and amenities.

*Top: Branding elephant seal pups to study life history of the species.*

Photo: H. BLACK



*Bottom: Hand-keyed morse is the most reliable means of radio communication between the station at Mawson and mainland Australia.*

Photo: G. LOWE







Photo: A. CAMPBELL-DRURY

*Top: An Army Dukw transfers diesel fuel from the expedition's supply ship to Wilkes during the annual relief of ANARE stations.*

## THE ANTARCTIC TREATY

On 1 December, 1959, the Antarctic Treaty was signed by the nations active in Antarctic research during the I.G.Y. They were Argentina, Australia, Belgium, Chile, the French Republic, Japan, New Zealand, Norway, the Union of South Africa, the Union of Soviet Socialist Republics, the United Kingdom of Great Britain and Northern Ireland and the United States of America; the Treaty is also open for accession by other States. The Treaty provides for complete freedom of access of scientific expeditions to any part of the Antarctic continent for interchange of the scientific information

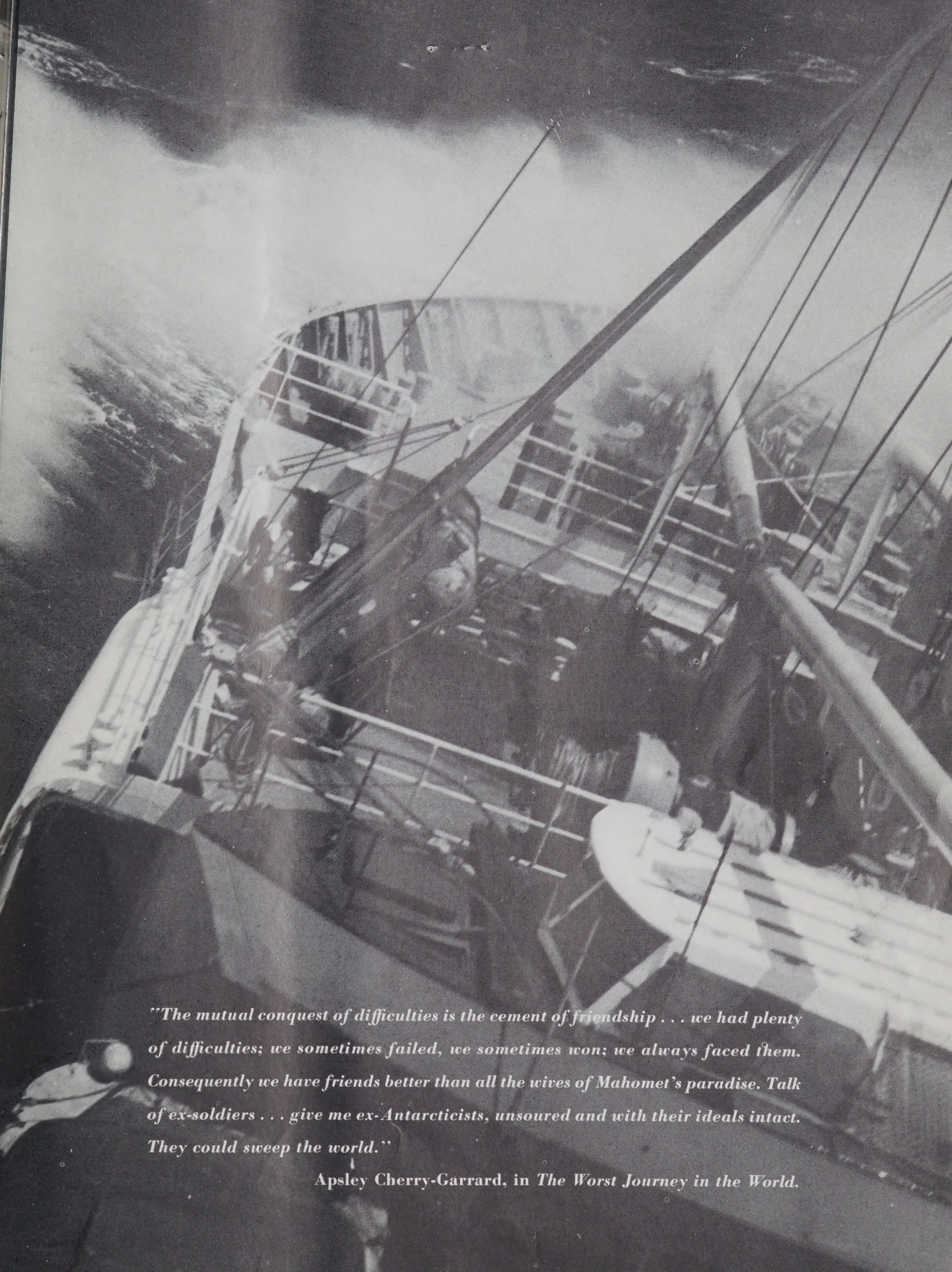
obtained, and for the exchange of scientific personnel. Under its terms no military activities of any kind may be carried on in Antarctica and a system of inspection by national observers will ensure that this provision is not evaded. Finally, the question of national claims will be placed in cold storage. Existing claims will be frozen so that no future activities of any country can affect the *status quo* as it existed at the date of the signing of the Treaty. The aim of the Treaty is to foster goodwill and co-operation amongst the nations working in Antarctica, with scientific advancement as their common purpose. It will remain in force for a minimum period of approximately 34 years.

*Bottom: A Weddell seal guards its newly-born pup. The teeming seal colonies of the south attracted many early voyagers to the Antarctic.*

Photo: P. G. LAW



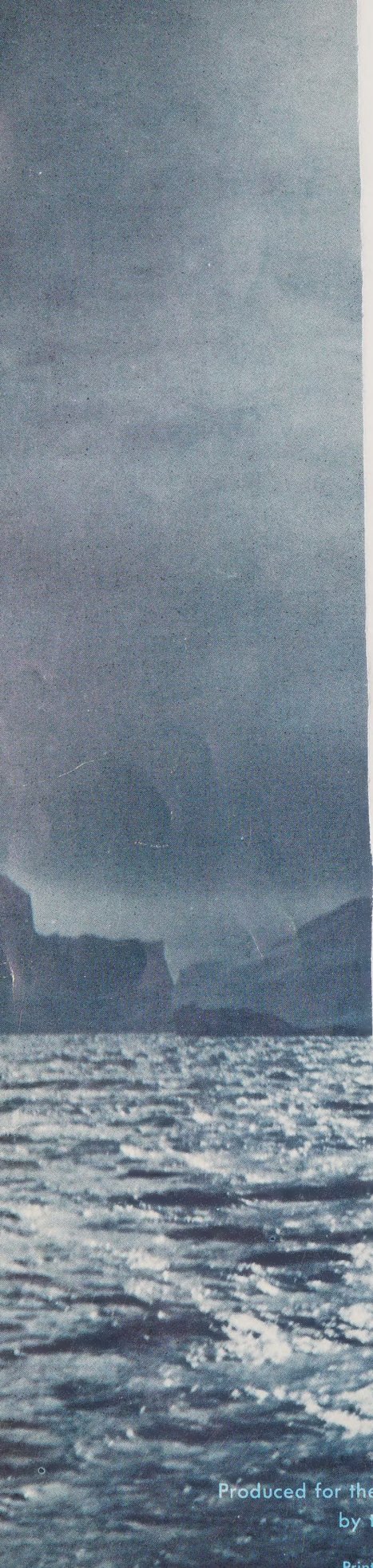




*"The mutual conquest of difficulties is the cement of friendship . . . we had plenty of difficulties; we sometimes failed, we sometimes won; we always faced them. Consequently we have friends better than all the wives of Mahomet's paradise. Talk of ex-soldiers . . . give me ex-Antarcticists, unsoured and with their ideals intact. They could sweep the world."*

Apsley Cherry-Garrard, in *The Worst Journey in the World*.





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